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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,350	06/23/2003	Jonathan H. Connell	YOR920030166US1	7454

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EXAMINER	
ARMSTRONG, ANGELA A	
ART UNIT	**PAPER NUMBER**
2626	

DATE MAILED: 06/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/601,350	CONNELL ET AL.	
	Examiner	Art Unit	
	Angela A. Armstrong	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

3. Claims 1-22 define non-statutory processed because they merely manipulate an abstract idea. The claimed process, a series of steps to be performed by a computer, amounts to a manipulation of an abstract idea since the process fails to provide any pre- or post- computer process activity.

Claims 1-9, 19-20 and 22 define non-statutory processed because the claims fail to include limitations of functional descriptive material that can impart functionality when employed as computer components so as to yield a useful, tangible, concrete result.

Applicant should note, however, that claims directed to speech or audio signal processing, would be considered to be statutory subject matter. For example, the requirement of the measurements of physical objects or activities to be transformed outside of the computer into computer data (In re Gelnovatch, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) (data- gathering step did not measure physical phenomenon); Arrhythmia, 958 F.2d at 1056, 22 USPQ2d at 1036), where the data comprises signals corresponding to physical objects or activities external to the computer system, and where the process causes a physical transformation of the signals which are intangible representations of the physical objects

or activities. Schrader, 22 F.3d at 294, 30 USPQ2d at 1459 citing with approval Arrhythmia, 958 F.2d at 1058-59, 22 USPQ2d at 1037-38; Abele, 684 F.2d at 909, 214 USPQ at 688; In re Taner, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982).

Examples of this type of claimed statutory process include the following:

- A method of using a computer processor to analyze electrical signals and data representative of human cardiac activity by converting the signals to time segments, applying the time segments in reverse order to a high pass filter means, using the computer processor to determine the amplitude of the high pass filter's output, and using the computer processor to compare the value to a predetermined value. In this example the data is an intangible representation of physical activity, i.e., human cardiac activity. The transformation occurs when heart activity is measured and an electrical signal is produced. This process has real world value in predicting vulnerability to ventricular tachycardia immediately after a heart attack.

- A method of using a computer processor to receive data representing Computerized Axial Tomography ("CAT") scan images of a patient, performing a calculation to determine the difference between a local value at a data point and an average value of the data in a region surrounding the point, and displaying the difference as a gray scale for each point in the image, and displaying the resulting image. In this example the data is an intangible representation of a physical object, i.e., portions of the anatomy of a patient. The transformation occurs when the condition of the human body is measured with X-rays and the X-rays are converted into electrical digital signals that represent the condition of the human body. The real world value of the invention lies in creating a new CAT scan image of body tissue without the presence of bones.

- A method of using a computer processor to conduct seismic exploration, by imparting spherical seismic energy waves into the earth from a seismic source, generating a plurality of reflected signals in response to the seismic energy waves at a set of receiver positions in an array, and summing the reflection signals to produce a signal simulating the reflection response of the earth to the seismic energy. In this example, the electrical signals processed by the computer represent reflected seismic energy. The transformation occurs by converting the spherical seismic energy waves into electrical signals, which provide a geophysical representation of formations below the earth's surface. Geophysical exploration of formations below the surface of the earth has real world value.

Examples of claimed processes that independently limit the claimed invention to safe harbor include:

- a method of conducting seismic exploration which requires generating and manipulating signals from seismic energy waves before "summing" the values represented by the signals (Taner, 681 F.2d at 788, 214 USPQ at 679); and

- a method of displaying X-ray attenuation data as a signed gray scale signal in a "field" using a particular algorithm, where the antecedent steps require generating the data using a particular machine (e.g., a computer tomography scanner). Abele, 684 F.2d at 908, 214 USPQ at 687 ("The specification indicates that such attenuation data is available only when an X-ray beam is produced by a CAT scanner, passed through an object, and detected upon its exit. Only after these steps have been completed is the algorithm performed, and the resultant modified data displayed in the required format.").

Examples of claimed processes that do not limit the claimed invention to pre-computing safe harbor include:

- "perturbing" the values of a set of process inputs, where the subject matter "perturbed" was a number and the act of "perturbing" consists of substituting the numerical values of variables (Gelnovatch, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 ("Appellants' claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step of the type we have held insufficient to change a nonstatutory method of calculation into a statutory process.... In this instance, the perturbed process inputs are not even measured values of physical phenomena, but are instead derived by numerically changing the values in the previous set of process inputs.")); and,

selecting a set of arbitrary measurement point values (Sarkar, 588 F.2d at 1331, 200 USPQ at 135). If a claim does not clearly fall into one or both of the safe harbors, the claim may still be statutory if it is limited to a practical application in the technological arts.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garg et al, "Frame-dependent multi-stream reliability indicators for audio-visual speech recognition," Proceedings of International Conference on Acoustics, Speech and Signal Processing, ICASSP

2003, vol. 1, April 2003, pages 24-27 in view of Masai et al (US Patent Application Publication 2003/0177005).

5. Regarding claim 1, Garg teaches a method for audio-visual speech recognition comprising: providing an acoustic-only data model and an acoustic-visual data model (pages 24-26; section 2, entitled "The Multi-Stream HMM"; section 3, entitled "Stream Reliability Indicators"; section 4, entitled "Reliability Based Stream Exponents."); and decoding at least a portion of an input spoken utterance using selected data models (pages 24-26; section 2, entitled "The Multi-Stream HMM"; section 3, entitled "Stream Reliability Indicators"; section 4, entitled "Reliability Based Stream Exponents"; Tables 1-2). Garg does not specifically teach a data model is selected based on a condition associated with the environment of the speaker. However, selecting an optimum data model for performing recognition based on environmental conditions so as to improve recognition accuracy and performance was well known in the art of speech recognition. Masai discloses (paragraph 75) a method and device for producing acoustic models for recognition and specifically teaches the speech recognition unit recognizes the speech data and convert them into text data in accordance with the environment information of the time when the speech data are uttered, the acoustic model for recognition selection unit selects the acoustic model for recognition according to the environment information and converts the speech data into text data by using the selected acoustic model for recognition.

It would have been obvious to one of ordinary skill at the time of the invention to modify the system of Garg to allow for the selection of the most optimum data model, as suggested by Masai, for the purpose of improving recognition accuracy and performance of the speech recognizer, as was well known in the art.

Regarding claim 2, Garg and Masai teach storing the acoustic-only data model and the acoustic-visual data model in memory such that model selection is made by shifting one or more pointers to one or more memory locations where the selected model is located (Page 26-27, section 5, "Database and Experiments").

Regarding claim 3, Garg and Masai teach model selection is based on a likelihood ratio test (pages 24-26; section 2, entitled "The Multi-Stream HMM"; section 3, entitled "Stream Reliability Indicators"; section 4, entitled "Reliability Based Stream Exponents").

Regarding claim 4, Garg and Masai teach model selection comprises selecting the acoustic-only data model when a result of the likelihood test is not greater than a threshold value (pages 24-26; section 2, entitled "The Multi-Stream HMM"; section 3, entitled "Stream Reliability Indicators"; section 4, entitled "Reliability Based Stream Exponents").

Regarding claim 5, Garg and Masai teach the model selection step comprises selecting the acoustic-visual data mode when a result of the likelihood test is not less than a threshold (pages 24-26; section 2, entitled "The Multi-Stream HMM"; section 3, entitled "Stream Reliability Indicators"; section 4, entitled "Reliability Based Stream Exponents").

Regarding claim 6, Garg and Masai teach the threshold value is based on a cost associated with a recognition error (Tables 1 and 2; section 3, "Stream Reliability Indicators).

Regarding claim 7, Garg and Masai teach the likelihood ratio test is based on one or more observations of a given visual feature (Tables 1 and 2; section 3, "Stream Reliability Indicators).

Regarding claim 8, Garg and Masai teach the given visual feature is associated with the mouth region of a speaker of the input utterance (Page 26-27, section 5, "Database and Experiments").

Regarding claim 9, Garg and Masai teach the model selection is performed at a rate substantially equivalent to an observation rate associated with the audio-visual speech recognition system (Page 26-27, section 5, "Database and Experiments").

6. Regarding claims 10-22; claims 10-22 are similar in scope and content to method claims 1-9 and are therefore rejected under similar rationale.

Response to Arguments

7. Applicant's arguments filed March 30, 2006, have been fully considered but they are not persuasive. Applicant argues Garg fails to disclose selecting between an acoustic-only data model and an acoustic-visual data model based on a condition associated with a visual environment, and decoding at least a portion of an input spoken utterance using the selected data model and that Masai contains no disclosure relating to a selection between an acoustic-only model and an acoustic-visual model. Applicant further argues neither Garg nor Masai individually teach or suggest the limitations of the independent claims and therefore the combination of Garg and Masai also fails to teach or suggest the limitations of the independent claims.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this instance, Garg was cited for teaching a method for audio-visual speech recognition implementing an acoustic-only data model and an acoustic-visual data model. While, Garg does not specifically teach a data model

is selected based on a condition associated with the environment of the speaker, it was well known in the art to provide a means for selecting an optimum data model for performing recognition based on environmental conditions so as to improve recognition accuracy and performance. Masai was cited for teaching this optimum data model selection. Masai discloses a method and device for producing acoustic models for recognition and specifically teaches the speech recognition unit recognizes the speech data and convert them into text data in accordance with the environment information of the time when the speech data are uttered, the acoustic model for recognition selection unit selects the acoustic model for recognition according to the environment information and converts the speech data into text data by using the selected acoustic model for recognition. Thus, the combination of Garg and Masai would provide for a speech recognition system, which utilizes acoustic-only data models and acoustic-visual data models (as provided by Garg), such that the most optimum sets of acoustic only and/or acoustic-visual data models are selected and used for recognition as determined by environment information of the time when the speech data is received (as provided by Masai).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela A. Armstrong whose telephone number is 571-272-7598. The examiner can normally be reached on Monday-Thursday 11:30-8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Angela A. Armstrong

Angela A Armstrong
Primary Examiner
Art Unit 2626

AAA
June 6, 2006